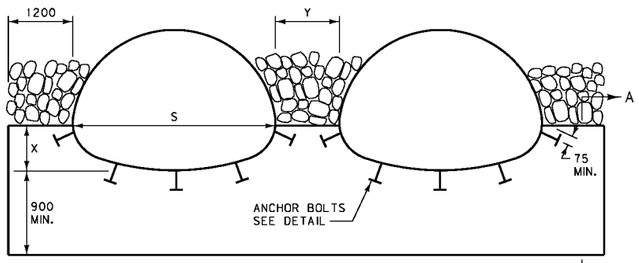
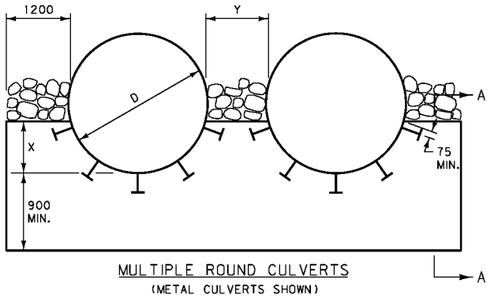
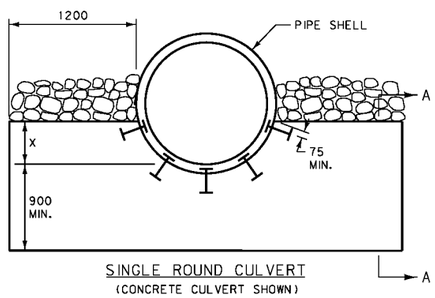


MULTIPLE ARCH CULVERTS
(METAL CULVERTS SHOWN)

X = VARIABLE (SEE DTL. DWG. NO. 603-10 FOR CONCRETE CULV. AND 603-34 FOR METAL CULV.)
Y = 0.5S WITH A MIN. OF 1200 AND A MAX. OF 2400 (OUTSIDE WALL TO OUTSIDE WALL)

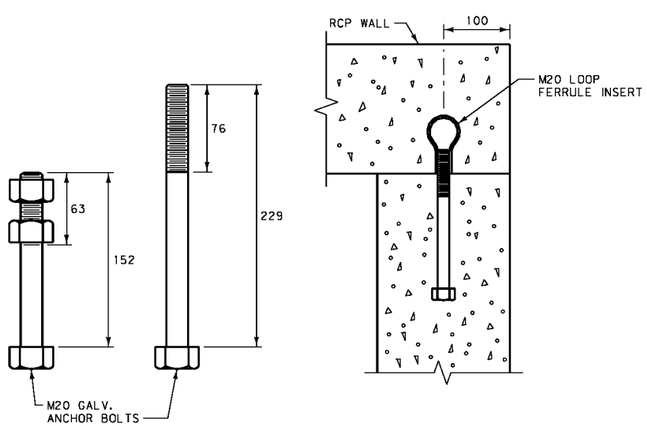


MULTIPLE ROUND CULVERTS
(METAL CULVERTS SHOWN)



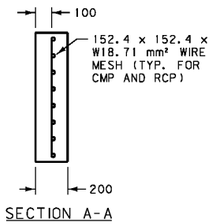
SINGLE ROUND CULVERT
(CONCRETE CULVERT SHOWN)

X = VARIABLE (SEE DTL. DWG. NO. 603-08 FOR CONCRETE CULV. AND 603-34 FOR METAL CULV.)
Y = 0.5D WITH A MIN. OF 1200 AND A MAX. OF 2400 (OUTSIDE WALL TO OUTSIDE WALL)



ANCHOR BOLT DETAILS
152 mm LONG FOR METAL PIPE
229 mm LONG FOR CONCRETE PIPE

ANCHOR BOLT SPACING:
MIN. OF FIVE M20 GALV. ANCHOR BOLTS IN WALL. USE MAX. SPACING OF 455 mm.



SECTION A-A

NOTES:

USE CL. "DD" CONCRETE OR EQUAL.

SEE DTL. DWG. NO. 603-18 AND 603-20 FOR BEDDING UNDER CULVERTS.

SEE DTL. DWG. NO. 613-14 FOR RIPRAP.

ALL DIMENSIONS ARE MILLIMETERS (mm) UNLESS OTHERWISE NOTED.

DETAILED DRAWING
REFERENCE STANDARD SPEC. SECTION 552
DWG. NO. 552-00

CONCRETE CUTOFF WALLS FOR CULVERTS

EFFECTIVE: AUGUST 1999

MDT MONTANA DEPARTMENT OF TRANSPORTATION — MONTANA CADD

DIAMETER OR SPAN x RISE (mm)	CUBIC METERS OF CLASS DD CONCRETE (EACH END)								CUBIC METERS OF RIPRAP (EACH END) ① (DTL. DWG. NO. 613-14)						m³ BEDDING MATERIAL ② PER METER OF PIPE (DTL. DWG. NO. 603-18)	
	CUTOFF WALL (DTL. DWG. NO. 552-00)		CONCRETE EDGE PROTECTION (DTL. DWG. NO. 613-08)													
			1.5:1		2:1		2.5:1		1.5:1		2:1		2.5:1			
	SING.	DBL.	SING.	DBL.	SING.	DBL.	SING.	DBL.	SING.	DBL.	SING.	DBL.	SING.	DBL.	SING.	DBL.
RCP (SQ. END)																
1200	0.9	1.6	1.5	2.3	1.8	2.7	~	~	6.2	9.9	7.7	12.3	~	~	2.34	4.68
1350	1.0	1.7	1.7	2.5	2.0	3.0	~	~	6.7	10.8	8.3	13.4	~	~	2.57	5.14
1500	1.1	1.8	1.8	2.7	2.2	3.3	~	~	7.2	11.7	9.0	14.5	~	~	2.80	5.60
1650	1.2	2.0	2.0	3.0	2.4	3.6	~	~	7.7	12.6	9.8	15.9	~	~	3.03	6.06
1800	1.2	2.1	2.2	3.2	2.6	3.9	~	~	8.4	13.7	10.4	17.0	~	~	3.27	6.54
1950	1.3	2.2	2.3	3.5	2.8	4.2	~	~	9.0	14.6	11.1	18.1	~	~	3.52	7.04
2100	1.4	2.4	2.5	3.7	3.0	4.5	~	~	9.5	15.6	11.8	19.3	~	~	3.78	7.56
2250	1.4	2.5	2.6	4.0	3.2	4.8	~	~	10.1	16.5	12.5	20.5	~	~	4.04	8.08
2400	1.5	2.6	2.8	4.2	3.4	5.1	~	~	10.6	17.5	13.2	21.7	~	~	4.31	8.62
RCPA (SQ. END)																
1485 x 915	0.9	1.4	1.5	2.2	1.8	2.7	~	~	6.2	10.1	7.7	12.6	~	~	2.39	4.78
1650 x 1015	0.9	1.5	1.6	2.5	1.9	2.9	~	~	6.7	11.0	8.3	13.6	~	~	2.60	5.20
1855 x 1145	1.0	1.6	1.8	2.7	2.1	3.3	~	~	7.3	12.0	9.0	15.0	~	~	2.84	5.68
2235 x 1370	1.1	1.8	2.1	3.3	2.6	3.9	~	~	8.6	14.5	10.7	17.9	~	~	3.27	6.54
2590 x 1575	1.1	2.0	2.5	3.8	3.0	4.6	~	~	9.8	16.6	12.2	20.5	~	~	3.66	7.32
2920 x 1830	1.3	2.2	2.7	4.3	3.3	5.2	~	~	10.8	18.3	13.3	22.7	~	~	4.15	8.30
3100 x 1960	1.3	2.2	2.9	4.6	3.6	5.6	~	~	11.5	19.6	14.3	24.4	~	~	4.33	8.66
3505 x 2215	1.4	2.4	3.4	5.3	4.1	6.4	~	~	13.1	22.4	16.2	27.8	~	~	4.81	9.62
3910 x 2460	1.5	2.6	3.8	6.1	4.6	7.4	~	~	14.7	25.3	18.2	31.4	~	~	5.31	10.62
4285 x 2705	1.6	2.8	4.0	6.4	4.9	7.8	~	~	15.4	26.7	19.1	33.1	~	~	5.73	11.46

DIAMETER OR SPAN x RISE (mm)	CUBIC METERS OF CLASS DD CONCRETE (EACH END)								CUBIC METERS OF RIPRAP (EACH END) ① (DTL. DWG. NO. 613-14)				SLOPE	m³ BEDDING MATERIAL ② PER LIN. m OF PIPE (DTL. DWG. NO. 603-18)	
	CUTOFF WALL (DTL. DWG. NO. 552-00)			CONCRETE EDGE PROTECTION (DTL. DWG. NO. 613-08)											
	SING.	DBL.		SING.	DBL.				SING.	DBL.				SING.	DBL.
RCP (FETS)															
1200	1.2	2.1		2.2	3.4				10.4	17.5			2.5:1	2.34	4.68
1350	1.3	2.2		2.0	3.1				9.3	15.7			2.0:1	2.57	5.14
1500	1.4	2.4		1.9	2.9				8.8	14.9			1.9:1	2.80	5.60
1650	1.4	2.3		2.2	3.4				9.8	16.7			1.7:1	3.03	6.06
1800	1.5	2.5		2.3	3.7				10.5	17.9			1.8:1	3.27	6.54
1950	1.5	2.6		2.6	4.1				11.6	19.8			1.8:1	3.52	7.04
2100	1.6	2.7		2.7	4.2				11.7	20.1			1.6:1	3.78	7.56
2250	1.7	2.9		2.8	4.5				12.3	21.3			1.5:1	4.04	8.08
RCPA (FETS)															
1485 x 915	1.2	2.0		2.1	3.3				10.8	18.3			3.0:1	2.39	4.78
1650 x 1015	1.3	2.2		2.2	3.4				11.3	19.2			3.0:1	2.60	5.20
1855 x 1145	1.4	2.3		2.3	3.6				11.9	20.4			3.0:1	2.84	5.68
2235 x 1370	1.5	2.6		2.1	3.4				10.4	18.0			2.0:1	3.27	6.54

NOTES:

① QUANTITIES ARE BASED ON A THICKNESS OF 600 mm AND ARE PROPORTIONED WHEN A DIFFERENT THICKNESS IS SPECIFIED.

② QUANTITIES ARE BASED ON NO. 3 FOUNDATION STABILIZATION WITH A WIDTH EQUAL TO (DIAMETER OR SPAN) + 1200 mm + (2 TIMES SHELL THICKNESS FOR CONCRETE OR 2 TIMES CORRUGATION WIDTH FOR METAL) AND A DEPTH EQUAL TO 600 mm PLUS "X". TO COMPUTE THE TOTAL BEDDING QUANTITY MULTIPLY BY (LENGTH OF PIPE MINUS 7.0 m).

SEE DTL. DWG. NO. 603-18 FOR DEFINITION OF NO. 3 FOUNDATION STABILIZATION AND "X" DIMENSION.

FOR PIPES WITH SKEW BEVEL ENDS - DIVIDE THE QUANTITIES SHOWN BY COSINE OF SKEW ANGLE.

DETAILED DRAWING
REFERENCE STANDARD SPEC. SECTION 552, 603, 613
DWG. NO. 552-04

CONCRETE, RIPRAP AND BEDDING MATERIAL QUANTITIES FOR SING. AND DBL. CULVERT INSTALLATION

EFFECTIVE: AUGUST 1999

MDT MONTANA DEPARTMENT OF TRANSPORTATION — MONTANA CADD

DIAMETER OR SPAN x RISE (m)	CUBIC METERS OF CLASS DD CONCRETE (EACH END)								CUBIC METERS OF RIPRAP① (EACH END) (DTL. DWG. NO. 613-14)						m³ BEDDING MATERIAL ② PER METER OF PIPE (DTL. DWG. NO. 603-18)	
	CUTOFF WALL (DTL. DWG. NO. 552-00)		CONCRETE EDGE PROTECTION (DTL. DWG. NO. 613-08) 1.5:1		2:1		2.5:1		1.5:1		2:1		2.5:1			
	SING.	DBL.	SING.	DBL.	SING.	DBL.	SING.	DBL.	SING.	DBL.	SING.	DBL.	SING.	DBL.	SING.	DBL.
SSPPA 152 mm x 51 mm CORRUGATIONS 457 mm CORNER RADIUS																
1.850 x 1.400	1.0	1.7	1.5	2.2	1.8	2.6	2.1	3.1	6.1	10.0	7.6	12.5	9.2	15.0	2.64	5.28
1.930 x 1.450	1.0	1.8	1.5	2.3	1.8	2.8	2.2	3.3	6.4	10.5	8.0	13.0	9.6	15.7	2.66	5.32
2.060 x 1.500	1.1	1.9	1.6	2.4	1.9	2.9	2.2	3.4	6.6	10.8	8.3	13.6	10.0	16.4	2.83	5.66
2.130 x 1.550	1.1	1.9	1.7	2.5	2.0	3.0	2.4	3.5	6.8	11.2	8.5	14.0	10.4	17.1	2.84	5.68
2.210 x 1.600	1.1	1.9	1.7	2.6	2.1	3.1	2.5	3.7	7.1	11.7	8.8	14.5	10.7	17.5	2.85	5.70
2.340 x 1.650	1.2	2.0	1.8	2.7	2.1	3.2	2.5	3.8	7.4	12.2	9.2	15.2	11.1	18.3	3.03	6.06
2.410 x 1.700	1.2	2.0	1.9	2.8	2.2	3.4	2.6	4.0	7.6	12.5	9.5	15.8	11.5	19.0	3.03	6.06
2.490 x 1.750	1.2	2.0	1.9	2.9	2.3	3.5	2.8	4.2	7.8	12.9	9.7	16.1	11.8	19.4	3.02	6.04
2.620 x 1.800	1.2	2.1	2.0	3.0	2.4	3.6	2.8	4.3	8.1	13.5	10.1	16.7	12.2	20.2	3.22	6.44
2.690 x 1.850	1.2	2.1	2.1	3.1	2.5	3.8	2.9	4.4	8.3	13.7	10.4	17.3	12.6	20.9	3.21	6.42
2.840 x 1.910	1.3	2.2	2.1	3.2	2.5	3.9	3.0	4.6	8.6	14.3	10.6	17.8	12.8	21.4	3.43	6.86
2.900 x 1.960	1.3	2.2	2.2	3.3	2.6	4.0	3.1	4.7	8.9	14.8	11.0	18.4	13.3	22.1	3.41	6.82
2.970 x 2.010	1.3	2.2	2.3	3.5	2.7	4.2	3.2	4.9	9.1	15.1	11.4	19.0	13.7	22.9	3.37	6.74
3.120 x 2.060	1.3	2.3	2.3	3.5	2.8	4.3	3.3	5.0	9.3	15.7	11.6	19.4	14.0	23.4	3.62	7.24
3.250 x 2.110	1.4	2.4	2.3	3.6	2.8	4.4	3.3	5.2	9.5	16.0	11.8	19.8	14.2	23.9	3.85	7.70
3.330 x 2.160	1.4	2.4	2.4	3.8	2.9	4.5	3.5	5.4	9.8	16.5	12.2	20.5	14.7	24.7	3.83	7.66
3.480 x 2.210	1.5	2.6	2.5	3.8	3.0	4.6	3.5	5.5	10.0	16.8	12.4	20.9	14.9	25.2	4.08	8.16
3.530 x 2.260	1.5	2.5	2.6	4.0	3.1	4.8	3.7	5.7	10.3	17.4	12.8	21.6	15.4	26.0	4.05	8.10
3.610 x 2.310	1.4	2.5	2.7	4.1	3.2	5.0	3.8	5.9	10.6	17.9	13.2	22.2	15.9	26.8	4.01	8.02
3.760 x 2.360	1.5	2.7	2.7	4.2	3.3	5.1	3.9	6.0	10.8	18.3	13.4	22.7	16.1	27.3	4.27	8.54
3.810 x 2.410	1.5	2.6	2.8	4.3	3.4	5.2	4.0	6.2	11.1	18.8	13.8	23.4	16.6	28.1	4.24	8.48
3.860 x 2.460	1.5	2.6	2.9	4.5	3.5	5.4	4.1	6.4	11.4	19.4	14.2	24.0	17.1	28.9	4.18	8.36
3.910 x 2.540	1.5	2.6	3.0	4.6	3.6	5.6	4.3	6.6	11.8	19.9	14.6	24.7	17.6	29.7	4.12	8.24
4.090 x 2.570	1.6	2.8	3.0	4.7	3.6	5.7	4.3	6.7	12.0	20.3	14.8	25.2	17.9	30.3	4.41	8.82
SSPPA 152 mm x 51 mm CORRUGATIONS 787 mm CORNER RADIUS																
4.040 x 2.840	1.8	3.2	2.8	4.4	3.4	5.3	4.0	6.3	11.2	19.0	13.9	23.6	16.7	28.5	5.23	10.46
4.110 x 2.900	1.8	3.2	2.9	4.5	3.5	5.5	4.1	6.5	11.4	19.5	14.2	24.2	17.1	29.2	5.19	10.38
4.270 x 2.950	1.9	3.3	2.9	4.7	3.5	5.6	4.2	6.6	11.7	19.9	14.5	24.8	17.5	29.9	5.46	10.92
4.320 x 3.000	1.9	3.3	3.1	4.8	3.7	5.8	4.4	6.9	12.1	20.7	15.0	25.7	18.1	31.0	5.39	10.78
4.390 x 3.050	1.9	3.3	3.2	5.0	3.8	6.0	4.5	7.1	12.4	21.2	15.4	26.3	18.6	31.8	5.34	10.68
4.550 x 3.100	2.0	3.4	3.2	5.0	3.8	6.1	4.6	7.2	12.5	21.5	15.6	26.7	18.8	32.2	5.66	11.32
4.670 x 3.150	2.1	3.6	3.2	5.1	3.9	6.1	4.6	7.3	12.6	21.7	15.7	27.0	18.9	32.6	5.98	11.96
4.750 x 3.200	2.0	3.6	3.3	5.3	4.0	6.4	4.8	7.6	13.1	22.5	16.3	27.9	19.6	33.7	5.90	11.80
4.830 x 3.250	2.0	3.5	3.5	5.5	4.2	6.6	5.0	7.8	13.5	23.2	16.8	28.8	20.3	34.7	5.82	11.64
4.950 x 3.300	2.1	3.7	3.4	5.5	4.2	6.6	4.9	7.9	13.6	23.4	16.8	29.0	20.3	35.0	6.19	12.38
5.030 x 3.350	2.1	3.7	3.6	5.7	4.3	6.9	5.1	8.2	14.0	24.1	17.4	29.9	21.0	36.1	6.10	12.20
5.180 x 3.400	2.2	3.8	3.6	5.8	4.3	6.9	5.1	8.2	14.1	24.4	17.5	30.3	21.1	36.5	6.45	12.90
5.230 x 3.450	2.2	3.8	3.7	5.9	4.5	7.1	5.3	8.5	14.5	25.0	18.0	31.0	21.7	37.4	6.40	12.80
5.310 x 3.510	2.1	3.8	3.8	6.1	4.6	7.4	5.5	8.8	14.9	25.7	18.5	32.0	22.3	38.5	6.30	12.60
5.460 x 3.560	2.2	3.9	3.9	6.2	4.7	7.5	5.6	8.9	15.1	26.2	18.8	32.5	22.6	39.2	6.62	13.24
5.510 x 3.610	2.2	3.9	4.0	6.4	4.8	7.7	5.7	9.1	15.5	26.8	19.2	33.3	23.2	40.2	6.55	13.10
5.660 x 3.660	2.3	4.1	4.0	6.5	4.8	7.8	5.7	9.2	15.6	27.1	19.4	33.7	23.4	40.6	6.92	13.84
5.720 x 3.710	2.3	4.1	4.1	6.6	5.0	8.0	5.9	9.5	16.1	27.9	19.9	34.6	24.0	41.7	6.82	13.64
5.870 x 3.760	2.4	4.2	4.2	6.7	5.0	8.1	6.0	9.6	16.2	28.2	20.1	35.0	24.3	42.2	7.19	14.38
5.940 x 3.810	2.4	4.2	4.3	6.9	5.2	8.4	6.2	9.9	16.7	29.0	20.7	36.0	25.0	43.4	7.09	14.18
5.990 x 3.860	2.3	4.2	4.4	7.1	5.3	8.6	6.3	10.2	17.0	29.6	21.2	36.8	25.5	44.3	7.02	14.04
6.070 x 3.910	2.3	4.1	4.5	7.3	5.5	8.8	6.5	10.5	17.5	30.3	21.7	37.6	26.2	45.4	6.90	13.80
6.220 x 3.960	2.4	4.3	4.6	7.4	5.5	8.9	6.6	10.6	17.6	30.7	21.9	38.2	26.4	46.0	7.29	14.58
6.270 x 4.010	2.4	4.3	4.7	7.5	5.7	9.1	6.7	10.8	18.0	31.3	22.4	38.9	27.0	46.9	7.20	14.40

NOTES:

① QUANTITIES ARE BASED ON A THICKNESS OF 600 mm AND ARE PROPORTIONED WHEN A DIFFERENT THICKNESS IS SPECIFIED.

② QUANTITIES ARE BASED ON NO. 3 FOUNDATION STABILIZATION WITH A WIDTH EQUAL TO (DIAMETER OR SPAN) + 1200 mm + (2 TIMES SHELL THICKNESS FOR CONCRETE OR 2 TIMES CORRUGATION WIDTH FOR METAL) AND A DEPTH EQUAL TO 600 mm PLUS "X". TO COMPUTE THE TOTAL BEDDING QUANTITY MULTIPLY BY (LENGTH OF PIPE MINUS 7.0 m).

SEE DTL. DWG. NO. 603-18 FOR DEFINITION OF NO. 3 FOUNDATION STABILIZATION AND "X" DIMENSION.

FOR PIPES WITH SKEW BEVEL ENDS - DIVIDE THE QUANTITIES SHOWN BY COSINE OF SKEW ANGLE.

DETAILED DRAWING
REFERENCE STANDARD SPEC. SECTION 552, 603, 613
DWG. NO. 552-06

CONCRETE, RIPRAP AND BEDDING MATERIAL QUANTITIES FOR SING. AND DBL. CULVERT INSTALLATION

EFFECTIVE: AUGUST 1999

MONTANA DEPARTMENT OF TRANSPORTATION — MONTANA CADD

DIAMETER OR SPAN x RISE (mm OR m)	CUBIC METERS OF CLASS DD CONCRETE (EACH END)								CUBIC METERS OF RIPRAP① (EACH END) (DTL. DWG. NO. 613-14)						m³ BEDDING MATERIAL ② PER METER OF PIPE (DTL. DWG. NO. 603-18)	
	CUTOFF WALL (DTL. DWG. NO. 552-00)		CONCRETE EDGE PROTECTION (DTL. DWG. NO. 613-08) 1.5:1		2:1		2.5:1		1.5:1		2:1		2.5:1			
	SING.	DBL.	SING.	DBL.	SING.	DBL.	SING.	DBL.	SING.	DBL.	SING.	DBL.	SING.	DBL.	SING.	DBL.
CSP 75 mm x 25 mm OR 125 mm x 25 mm CORRUGATIONS																
1350	0.9	1.4	1.5	2.2	1.8	2.6	~	~	6.1	9.7	7.5	12.0	~	~	2.09	4.18
1500	0.9	1.5	1.6	2.4	2.0	2.9	~	~	6.5	10.4	8.1	13.0	~	~	2.27	4.54
1650	1.0	1.6	1.8	2.6	2.1	3.1	~	~	7.0	11.2	8.7	13.9	~	~	2.45	4.90
1800	1.0	1.7	1.9	2.8	2.3	3.4	~	~	7.4	12.0	9.2	14.9	~	~	2.63	5.26
1950	1.1	1.8	2.0	3.0	2.5	3.6	~	~	7.9	12.8	9.8	15.8	~	~	2.82	5.64
2100	1.1	1.9	2.2	3.2	2.6	3.9	~	~	8.4	13.6	10.4	16.8	~	~	3.01	6.02
2250	1.2	2.0	2.3	3.5	2.8	4.2	~	~	8.8	14.4	11.1	18.2	~	~	3.20	6.40
2400	1.3	2.2	2.5	3.7	3.0	4.4	~	~	9.5	15.5	11.7	19.2	~	~	3.40	6.80
2550	1.3	2.3	2.6	3.9	3.2	4.7	~	~	9.9	16.3	12.3	20.2	~	~	3.61	7.22
2700	1.4	2.4	2.7	4.1	3.3	5.0	~	~	10.4	17.1	12.9	21.2	~	~	3.82	7.64
2850	1.4	2.5	2.9	4.3	3.5	5.2	~	~	10.9	18.0	13.6	22.3	~	~	4.03	8.06
3000	1.5	2.6	3.0	4.6	3.7	5.5	~	~	11.4	18.8	14.2	23.3	~	~	4.25	8.50
SSPP 152 mm x 51 mm CORRUGATIONS																
3.205	1.6	2.7	3.3	4.9	4.0	6.0	~	~	12.2	20.1	15.1	24.9	~	~	4.52	9.04
3.360	1.6	2.9	3.4	5.2	4.2	6.3	~	~	12.7	21.0	15.8	26.1	~	~	4.75	9.50
3.515	1.7	3.0	3.6	5.4	4.3	6.6	~	~	13.3	22.0	16.5	27.2	~	~	4.99	9.98
3.670	1.8	3.1	3.7	5.7	4.5	6.9	~	~	13.8	22.9	17.1	28.4	~	~	5.23	10.46
3.825	1.8	3.2	3.9	5.9	4.7	7.2	~	~	14.4	23.9	17.8	29.6	~	~	5.48	10.96
3.980	1.9	3.4	4.1	6.2	4.9	7.5	~	~	14.9	24.8	18.5	30.8	~	~	5.73	11.46
4.135	2.0	3.5	4.2	6.4	5.1	7.8	~	~	15.5	25.8	19.2	32.0	~	~	5.99	11.98
4.290	2.1	3.6	4.4	6.7	5.3	8.1	~	~	16.1	26.8	20.0	33.3	~	~	6.25	12.50
4.445	2.1	3.8	4.6	7.0	5.5	8.5	~	~	16.7	27.8	20.7	34.5	~	~	6.52	13.04
4.600	2.2	3.9	4.7	7.2	5.8	8.8	~	~	17.3	28.9	21.4	35.8	~	~	6.79	13.58
4.755	2.3	4.0	4.9	7.5	6.0	9.1	~	~	17.8	29.9	22.1	37.1	~	~	7.06	14.12
4.910	2.3	4.2	5.1	7.8	6.2	9.5	~	~	18.4	30.9	22.9	38.4	~	~	7.34	14.68
5.065	2.4	4.3	5.2	8.1	6.4	9.8	~	~	19.0	32.0	23.6	39.7	~	~	7.63	15.26
5.220	2.5	4.5	5.4	8.4	6.6	10.1	~	~	19.7	33.1	24.4	41.0	~	~	7.92	15.84
5.375	2.6	4.6	5.6	8.6	6.8	10.5	~	~	20.3	34.2	25.2	42.4	~	~	8.21	16.42
5.530	2.7	4.8	5.8	8.9	7.0	10.8	~	~	20.9	35.3	25.9	43.7	~	~	8.51	17.02
5.685	2.7	4.9	5.9	9.2	7.2	11.2	~	~	21.5	36.4	26.7	45.1	~	~	8.82	17.64
5.840	2.8	5.1	6.1	9.5	7.5	11.6	~	~	22.2	37.5	27.5	46.5	~	~	9.13	18.26
5.995	2.9	5.2	6.3	9.8	7.7	11.9	~	~	22.8	38.6	28.3	47.9	~	~	9.44	18.88
6.150	3.0	5.4	6.5	10.1	7.9	12.3	~	~	23.5	39.8	29.1	49.3	~	~	9.76	19.52
6.305	3.1	5.5	6.7	10.4	8.1	12.7	~	~	24.1	40.9	29.9	50.8	~	~	10.08	20.16
6.460	3.1	5.7	6.9	10.7	8.4	13.0	~	~	24.8	42.1	30.7	52.2	~	~	10.41	20.82
CSPA 68 mm x 13 mm CORRUGATIONS																
1440 x 970	0.9	1.4	1.2	1.7	1.4	2.0	~	~	5.1	8.2	6.3	10.2	~	~	2.05	4.10
1620 x 1100	0.9	1.5	1.3	1.9	1.5	2.3	~	~	5.5	8.9	6.8	11.0	~	~	2.23	4.46
1800 x 1200	1.0	1.6	1.4	2.0	1.6	2.4	~	~	5.8	9.5	7.2	11.8	~	~	2.42	4.84
1950 x 1320	1.0	1.7	1.5	2.2	1.7	2.6	~	~	6.2	10.1	7.7	12.5	~	~	2.58	5.16
2100 x 1450	1.1	1.8	1.6	2.4	1.9	2.8	~	~	6.6	10.8	8.1	13.4	~	~	2.74	5.48
CSPA 75 mm x 25 mm CORRUGATIONS																
1010 x 790	0.8	1.3	0.9	1.4	1.1	1.6	~	~	4.2	6.7	5.3	8.4	~	~	1.78	3.56
1160 x 920	0.8	1.4	1.0	1.5	1.2	1.8	~	~	4.5	7.2	5.6	9.0	~	~	1.98	3.96
1340 x 1050	0.9	1.5	1.2	1.7	1.4	2.1	~	~	5.0	8.1	6.3	10.1	~	~	2.15	4.30
1520 x 1170	1.0	1.6	1.2	1.9	1.5	2.2	~	~	5.3	8.6	6.6	10.7	~	~	2.38	4.76
1670 x 1300	1.0	1.7	1.4	2.0	1.6	2.4	~	~	5.8	9.4	7.2	11.7	~	~	2.59	5.18
1850 x 1400	1.1	1.8	1.4	2.2	1.7	2.6	~	~	6.1	9.9	7.5	12.3	~	~	2.81	5.62
2050 x 1500	1.1	1.9	1.6	2.4	1.9	2.9	~	~	6.6	10.9	8.2	13.5	~	~	2.86	5.72
2200 x 1620	1.2	2.0	1.7	2.6	2.0	3.1	~	~	7.0	11.6	8.7	14.4	~	~	3.07	6.14
2400 x 1720	1.2	2.1	1.8	2.7	2.2	3.3	~	~	7.4	12.2	9.2	15.2	~	~	3.27	6.54
2600 x 1820	1.3	2.2	1.9	2.9	2.3	3.5	~	~	7.8	12.9	9.7	16.1	~	~	3.50	7.00
2840 x 1920	1.4	2.4	2.0	3.1	2.4	3.7	~	~	8.2	13.6	10.1	16.9	~	~	3.72	7.44
2970 x 2020	1.5	2.5	2.1	3.3	2.5	3.9	~	~	8.6	14.3	10.6	17.8	~	~	3.94	7.88
3240 x 2120	1.5	2.6	2.2	3.4	2.7	4.1	~	~	9.0	15.0	11.1	18.7	~	~	4.16	8.32
3470 x 2220	1.6	2.7	2.3	3.6	2.8	4.3	~	~	9.4	15.8	11.6	19.6	~	~	4.38	8.76
3600 x 2320	1.7	2.9	2.4	3.8	2.9	4.6	~	~	9.8	16.5	12.1	20.5	~	~	4.62	9.24

NOTES:

① QUANTITIES ARE BASED ON A THICKNESS OF 600 mm AND ARE PROPORTIONED WHEN A DIFFERENT THICKNESS IS SPECIFIED.

② QUANTITIES ARE BASED ON NO. 3 FOUNDATION STABILIZATION WITH A WIDTH EQUAL TO (DIAMETER OR SPAN) + 1200 mm + (2 TIMES SHELL THICKNESS FOR CONCRETE OR 2 TIMES CORRUGATION WIDTH FOR METAL) AND A DEPTH EQUALTO 600 mm PLUS "X". TO COMPUTE THE TOTAL BEDDING QUANTITY MULTIPLY BY (LENGTH OF PIPE MINUS 7.0 m).

SEE DTL. DWG. NO. 603-18 FOR DEFINITION OF NO. 3 FOUNDATION STABILIZATION AND "X" DIMENSION.

FOR PIPES WITH SKEW BEVEL ENDS - DIVIDE THE QUANTITIES SHOWN BY COSINE OF SKEW ANGLE.

DETAILED DRAWING
REFERENCE STANDARD SPEC. SECTION 552, 603, 613
DWG. NO. 552-08

CONCRETE, RIPRAP AND BEDDING MATERIAL QUANTITIES FOR SING. AND DBL. CULVERT INSTALLATION

EFFECTIVE: AUGUST 1999

MONTANA DEPARTMENT OF TRANSPORTATION — MONTANA CADD